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## News Summary

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JOHN C. PHILLIPS

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**A professor of botany** believes cellular slime molds are a key to restoring tropical rain forests: Page A4.

**Stanford University released** a 244-page report examining race relations on the campus: Page A15.

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**An Oklahoma newspaper** advertisement has sparked a political battle that has endangered the state's higher-education budget: Page A23.

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# NCAA Chief to Seek Accrediting System for College Sports

## Plan comes at time public is seen skeptical of athletics' integrity

By DOUGLAS LEDERMAN

The executive director of the National Collegiate Athletic Association this month will ask college presidents and other N.C.A.A. leaders to consider implementing a system of accreditation for the sports programs of the association's 800 members. The proposal, from Richard D. Schultz, the N.C.A.A. chief, is a dramatic departure from past practice in the association.

It comes at a time when evidence is mounting that the public is becoming increasingly skeptical about the integrity of big-time college sports. A Media General / Associated Press poll released last week showed that most Americans believe that colleges overemphasize sports and that athletes are paid under the table.

That unfavorable report followed on the heels of a *Time* magazine cover story about the failure of universities that sponsor big-time sports programs to provide their athletes with an education, and a major *Sports Illustrated* story that called big-time college sports "an American disgrace." Those reports detailed cases of rule-

*Continued on Page A38*

ERIC POGGENPOHL

**Richard D. Schultz: N.C.A.A. members would be reviewed every five years in such areas as recruiting, admissions standards, and graduation rates.**

# *More Minority Programs Now Emphasizing Efforts to Keep Students Enrolled in College*

By MARY CRYSTAL CAGE

More and more state governments and university systems are shifting the emphasis of their programs for minority students from recruiting them to keeping them in college until they graduate.

States are developing strategies to increase the number of minority students who transfer from two-year to four-year institutions; they are designing computer programs to track student performance and evaluate institutional efforts; and they are drafting codes of conduct to try to reduce the level of racism on their campuses.

They are also providing financial sticks and carrots for colleges that fail or succeed to take such measures themselves.

### 'A Revolving Door'

"If we don't deal with the total environment in which students study, simply removing economic obstacles just provides a revolving door," says T. Edward Hollander, chancellor of the New Jersey Board of Higher Education.

"We made the same mistake in New Jersey that everyone around the country made. Initially, we thought that the issue of minority access was recruitment. We quickly found that was insufficient. Students need much more support than we anticipated."

Twenty years ago, when the drive to bring minority students into America's colleges began, retention was sadly ignored, says Charles E. Morris, chairman emeritus of the Illinois Committee on Black Concerns in Higher Education.

Mr. Morris, who is also vice-president of academic services at Illinois State University, says one way state universities could easily keep more minority students in college is by changing the "abysmal" rates of transfer from community colleges to four-year institutions.

"A large number of them aren't even enrolled in transfer programs," Mr. Morris

*Continued on Page A24*

# Investigators to Visit Campuses to Check for Illegal Drug Use

## Probe will focus on compliance with law by Pell Grant recipients

BALTIMORE

Education Secretary Lauro F. Cavazos announced here last week that Education Department investigators would make spot checks on college campuses to determine if Pell Grant recipients are complying with a new law barring illegal drug use by those obtaining federal grants.

Under the law, which was enacted last year, Pell Grant recipients, starting this fall, must sign a statement that says: "I will not engage in the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance during the period covered by my Pell Grant." (The federal government does not classify alcohol as a controlled substance.)

### No Plans for Drug Testing

Mr. Cavazos offered few specifics about the enforcement campaign, which he announced at the annual meeting of the National Conference on Drug-Free Schools and Communities.

Jim Bradshaw, a spokesman for the department, said he thought Education Department officials who make the campus visits would try to determine whether students receiving Pell Grants had signed the pledge and if those who had signed it were in fact not using drugs.

Asked whether drug tests would be used, he said: "Absolutely not."

In his speech, Mr. Cavazos said "we expect to rely on tips from the public" in finding Pell Grant recipients who use ille-

*Continued on Page A26*

# Boston University May Soon Get the Opportunity It Wants: to Run–and Reform–a City's Schools

By BEVERLY T. WATKINS

BOSTON

At an elementary school in nearby Chelsea, a television meteorologist used two clear plastic bottles partly filled with water to show attentive fifth and sixth graders just how a tornado develops. The splashy presentation marked the kick-off of an interdisciplinary science program that Boston University has started with the city's schools.

The new program is the first piece in a bold 10-year plan by the university to take over management of the Chelsea public schools and reform them.

The unprecedented plan got a boost last month when the Chelsea School Committee approved a contract giving the university authority to run the system. The plan had been on hold since November as lawyers looked for solutions to issues raised by critics.

If and when the plan is put into full operation, it will mark the first time that a pri-

*Continued on Page A16*

FRED FRAY, BOSTON UNIVERSITY

**A Chelsea pupil and a Boston University instructor discuss how tornadoes start, in a science program marking the university's growing role in the schools.**

## MARGINALIA

From *Campus USA*:

". . . Some words lend themselves to memory tricks called pneumonics. Take the problem of whether to write 'stationary' or 'stationery.' If you remember 'e' for 'envelope,' then you'll remember that the paper business is 'stationery.' The more ridiculous the pneumonic, the better. For example, in trying to remember the 'd' in 'bludgeon,' remember, 'There will be "blud" when I bludgeon him.' Silly as they sound, these devices really help."

So what else is pneu?

■

Notice from the honors program at the University of Portland:

" 'The CIA poses the ultimate treat to democracy, and is a major cause of the world's move toward nuclear extinction,' charges John Stockwell, who will speak on campus Monday, March 27, 1989. . . ."

Masochist!

■

You may recall that on March 29, in this space, Barry Glassner, of the University of Connecticut, asked: "If university departments were to start radio stations, what would their call letters be?" He answered his own question with such suggestions as WRNR (leisure studies), WYMI (philosophy), and WIXL (honors program).

Now J. Thomas Lockard, of Kenyon College, signs on with *these* call letters:

The development office: KASH
Health services: KARE
Philosophy: KANT
Music: WHUM
Athletics: WWIN
Admissions: WURN

That last one means "You are in," Mr. Lockard explains helpfully.

■

The new mathematics, Kentucky subdivision (from the University of Kentucky *Kernel*):

"She said 47 percent of all full-time faculty at full professor rank were men and only 17 percent were women. . . ."

■

The new mathematics, New York division (from *The Faculty Voice*, a publication of the Syracuse University chapter of the American Association of University Professors):

"*Erratum*—in Table 1 of the Chapter's 1988-89 'Committee Z Report,' it was mistakenly indicated that there were 132 instructors at the University earning an average salary of $6,227 each. The correct figures are 13 instructors at $26,227 each."

■

From *University Times* (California State University, Los Angeles):

ACADEMIC SENATE DISCUSSES CIRRICULUM CHANGES

May we suggest one? —C.G.

## In Brief

### 200 at Central Michigan Protest Minimum Wage

Nearly 200 student employees at Central Michigan University walked off their jobs for a day last week to protest the low hourly wage the university pays them for working in cafeterias and the library.

The students criticized the university for paying student employees the federal minimum wage, $3.35 an hour, since 1981, while increasing the president's salary 61 per cent and raising tuition 73 per cent. More than 4,000 students hold jobs at the university.

Around the country, other students have held similar rallies in support of a bill now in Congress that would raise the minimum wage to $4.65 by 1992.

A Central Michigan spokesman said administrators did not plan to increase salaries for part-time workers. "We don't have much choice," the spokesman said. "We have a financial squeeze going on throughout the university."

### *Animals Treated on Campus After Oil Spill*

VALDEZ, ALASKA

Two campus buildings at Prince William Sound Community College have been converted into temporary animal-rescue centers to treat birds and otters damaged when the oil tanker *Exxon Valdez* ran aground and spewed oil into Alaskan waters.

As of late last week, about 100 birds and 50 otters had been cleaned of oil and treated (*right*) at the rescue centers, said Michael A. Lewis, a spokesman for the college.

At first, both birds and otters were being treated in a dormitory on the campus, but the building was soon overwhelmed. The college then offered its gymnasium to the rescue effort, which is being financed by the Exxon Shipping Company, Mr. Lewis said.

Last week workers converted the gymnasium into an "otter hospital" with 60 large tanks to clean and treat the animals. Birds continued to be treated at the dormitory.

Students and employees at the college have been volunteering in the animal-rescue effort. "People on campus can at least work on the animal cleanup and work out their frustrations over the spill," Mr. Lewis said.

—DENISE K. MAGNER

REUTERS/BETTMANN NEWSPHOTOS

### Teach About AIDS Risks, Medical Schools Are Told

Medical schools should make sure their students are prepared to care for people with AIDS, according to a committee of the Association of American Medical Colleges.

The committee said the schools should teach students not only about AIDS, sexuality, substance abuse, epidemiology, and public health, but also about the risks that physicians face in treating people infected with H.I.V., the virus that causes AIDS. The schools should also help students overcome their biases and prepare them to cope with the psychological effects of losing young patients, said the committee, which is formally called the Committee on AIDS and the Academic Medical Center.

The pervasiveness of H.I.V. infection will outstrip the ability of H.I.V. specialists to care for people with AIDS, the committee said, making it necessary for primary-care physicians to help more.

Copies of the committee's 18-page report, "The H.I.V. Epidemic and Medical Education," are available for $12.50 each from the association's publications department at One Dupont Circle, N.W., Washington 20036.

### Vandals Hit Mich. Paper, Calling It 'PLO Daily'

Vandals attacked the offices of the University of Michigan's student newspaper last week, defacing walls with spray-painted slogans warning editors that "Jew Haters Will Pay" and calling the paper the "P.L.O. Daily."

The break-in followed a protest last month by nearly 200 students, who criticized the paper, the *Michigan Daily*, for what they said was its anti-Israel policy. In particular, the protesters objected to an editorial discussing rumors that Israel, along with Arab nations, could be responsible for the bombing of Pan American Airways flight 103, which exploded over Scotland in December.

*Daily* editors later met with protesters to discuss the editorials.

The *Daily*'s editor, Adam Schrager, said: "My emotions range from anger to fear. I've taken great steps to address this issue. Someone obviously has not been listening."

Two days before the incident, Michigan's president, James J. Duderstadt, sent letters to all 35,000 students on the Ann Arbor campus asking them to be more tolerant of ethnic, racial, and religious differences.

Mr. Duderstadt also said harassment or expressions of racism or sexism were "intolerable."

### Morris Brown Students Protest Dorm Conditions

Students at Morris Brown College took over the administration building for 36 hours to protest unsanitary conditions in the dormitories, poor cafeteria food, and

### *New Study Confirms Controversial Finding on Above-Average Test Scores*

By JEAN EVANGELAUF

SAN FRANCISCO

A controversial finding in 1987 that most schoolchildren in all states earn above-average scores on national achievement tests has been confirmed by a new federally sponsored study.

In announcing their preliminary results here at the annual meeting of the American Educational Research Association, researchers said that John Jacob Cannell, a physician who garnered national attention when he reported his surprising conclusion, was essentially correct. But they added that he had overstated the extent to which states and school districts report above-average achievement.

#### Feels 'Vindicated'

Dr. Cannell, who has become something of a gadfly on testing issues since releasing his study, said he felt "vindicated" by the new findings. "I do feel that my main points have been corroborated," he said.

Dr. Cannell was "clearly right" about his basic conclusion, said Daniel M. Koretz, a senior social scientist with the RAND Corporation who commented on the research at a meeting here. "In comparison with national norms, districts and states are presenting inflated results, results which are misleading the public," he said.

The researchers gave no definitive reasons for the above-average scores, but suggested the following contributed to score gains:

- The use of national norms that are out of date or not representative.
- Improvements in students' test-taking ability.
- The teaching of items that appear on the tests.
- Actual gains in achievement.

Students who take norm-referenced tests are measured against the performance of a national sample that could be as much as seven years old, not against the performance of others who take the test in the same year.

Dr. Cannell rejected the notion that achievement had improved, saying that such other measures of achievement as high-school graduation rates and scores on college-admissions test showed little or no improvement.

He instead blamed test publishers for above-average scores. "Teaching the questions leads to happiness throughout the jock-ocracy of the phys-ed majors and coaches that run America's public schools," he said.

"When the jock-ocracy gets rising scores, publishers get rising sales, so the publishers make sure the teachers teach the test by making sure the teachers know the exact questions," he added.

Eva L. Baker, director of the Center for Research on Evaluation, Standards, and Student Testing at the University of California at Los Angeles and a member of the research team, criticized the growing use of norm-referenced tests, and called for better measures of achievement.

"When normed tests are used as a reform instrument for accountability purposes rather than as a very general check on the system," she said, "then the potential for evil consequences occurs."

Leigh Burstein, a professor of education at U.C.L.A. and another member of the research team, added: "If this super concern about how many kids score above the average dominates the discussion, we will have lost the battle."

"We need both better yardsticks and better use of them," he said.

Dr. Cannell supported the use of national tests, saying that testing "really defines how good the curriculum is." National norms are important, he said. "States want to compare themselves to the nation."

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inadequate security on the campus.

Although only 20 students occupied the building, 100 or so people, not all of them students at the college, stood outside throughout the protest to show their support.

The sit-in ended when the administration agreed to address the problems.

Cynthia M. Bell, a spokeswoman for the college, said many of the students' complaints were already being addressed. The protest was sparked by students' concern over a deadline for paying deferred tuition and fees, she said. The deadline was extended.

## Florida State U. Student Accused of Harassment

Police at Florida State University have filed charges against a student accused of making death threats against a professor, following his family, telephoning him 97 times in a single night, and having pizzas delivered to his home without his knowledge.

The student had taken a class taught by the professor, Philip Bowers, who teaches mathematics, police said. After the harassment incidents began, the student removed her file from the campus health center, where she had gone for counseling, they said.

The student has been charged with one count of disruption of an educational institution and one count of petty theft for taking the file. As a condition of her release, she was ordered by court officials to have no further contact with Mr. Bowers or his family. But police said she continued to harass the family.

The student was also later charged with making harassing phone calls. All three misdemeanor charges were pending, and the case was under investigation.

Police had not determined what prompted the incidents, but others familiar with the case said the student had shown a romantic interest in the professor and was upset when he failed to respond.

A lawyer for the student said she denied the allegations.

## Trustees of Colby-Sawyer Vote to Enroll Men

The trustees of Colby-Sawyer College have voted 22 to 1 to admit men in the fall of 1990.

The vote came after several weeks of student protests and demonstrations against coeducation. The all-women's college, located in New London, N.H., started as a coeducational secondary school in 1830 and today has 450 students. The trustees said the goal was to enroll 40 men in the 1990 freshman class.

## Correction

A map showing state-by-state changes in the number of high-school graduates from 1986 to 2004 contained outdated information for Oregon (*The Chronicle*, March 1). In a revision of its data, the Western Interstate Commission for Higher Education said it expected Oregon to see a decline of 1 per cent, not 16 per cent.

**PORTRAIT**

# *A Physics Professor Proves TV Can Handle the Tough Subjects*

By JUDITH AXLER TURNER

For David L. Goodstein, pretending to teach a physics class is more difficult than actually teaching a physics class.

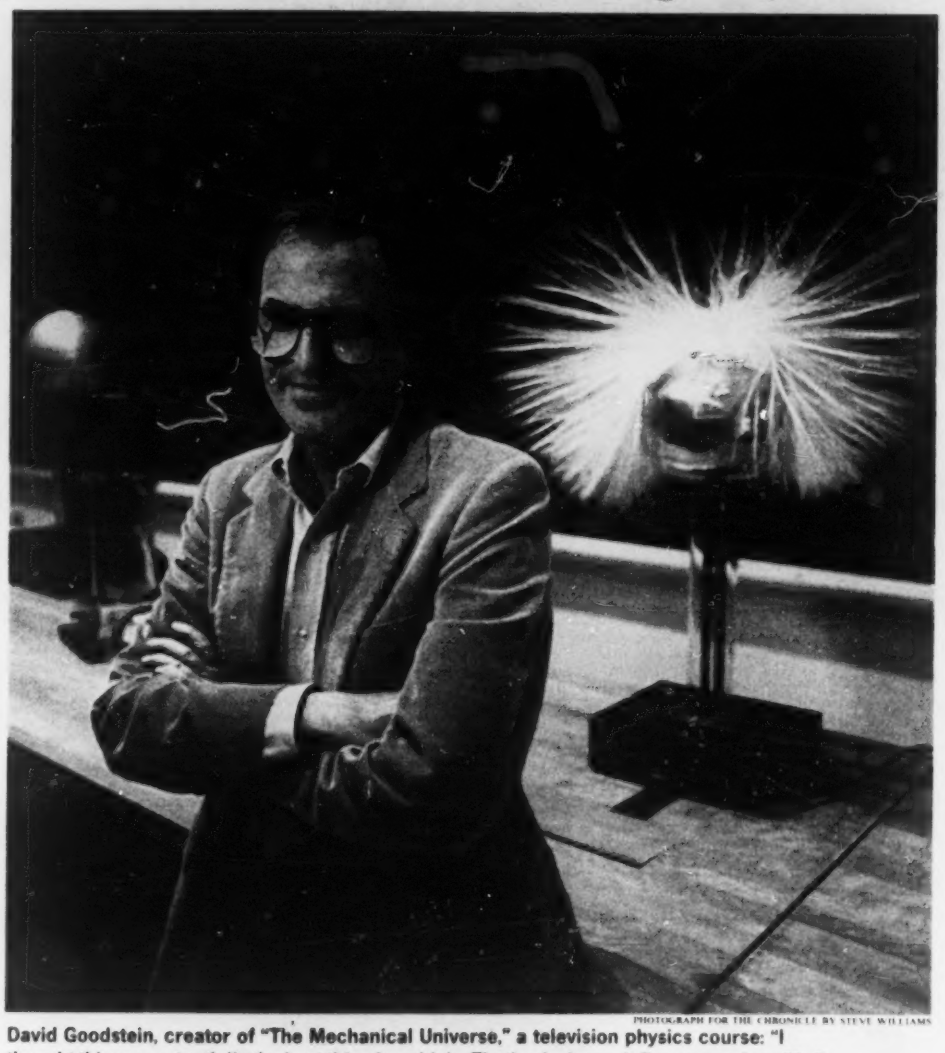
Mr. Goodstein, whose 52-part freshman-physics television course, "The Mechanical Universe," has made him a star in many high schools and colleges, discovered that when he was filming the opening and closing segments of the show—sequences that feature him in a specially wood-paneled classroom at the California Institute of Technology, where he normally teaches without the wood paneling.

Teaching a class of 20 "extras" told him a lot about teaching.

"They didn't know what I was talking about," Mr. Goodstein says. He realized then how much he depends on students for cues about how well he is conveying information. With a class that neither knew nor cared about his lecture, Mr. Goodstein was lost.

The producer finally solved the problem by bringing in a few real students—people who could follow the lecture.

"There is something human about direct contact, about feedback, that makes lectures work," says Mr. Goodstein.



PHOTOGRAPH FOR THE CHRONICLE BY STEVE WILLIAMS

**David Goodstein, creator of "The Mechanical Universe," a television physics course: "I thought this was potentially the best thing I could do. That's why I gave it five years of my life."**

### The Stuff of TV Commercials

Creating a television course that could be effective without human contact was a challenge. Mr. Goodstein's solution was to use the stuff of television commercials: drama and animation. "The Mechanical Univer e" has actors playing physics greats such as Isaac Newton and Gottfried Wilhelm von Leibnitz writing with quill pens, arguing, and eating—scenes designed to capture the people behind the ideas.

It also has some 550 animated sequences. In some, equations move about the screen in an "algebraic ballet" like members of a marching band rearranging themselves in new formations. In others, a cartoon David—who looks suspiciously like Mr. Goodstein—flings a stone at a cartoon Goliath.

In the segment on relativity and the speed of light, a cartoon Albert Einstein and a cartoon Hendrik Antoon Lorentz demonstrate why observers moving at different speeds measure light differently, even though it is traveling at a constant speed. "That's the program I show to physicists," Mr. Goodstein says. "It always leaves them speechless."

Despite the mathematics and the difficult physics, the show appeals both to physicists and to casual television watchers. It was popular enough in Miami to get a Nielsen rating—number two in its time slot.

The entire series is an answer to those who say that television cannot handle tough subjects. "The Mechanical Universe" has won 20 awards, including the prestigious Japan Prize for Television, the world's most coveted award for educational programming.

The show's backers are happy, too, despite the enormous cost of the series. Most of the money—$6-million—came from the Annenberg/Corporation for Public Broadcasting Project, which distributes tapes of the show to public-television stations, colleges and universities, and libraries. An additional $3.5-million came from the National Science Foundation. The International Business Machines Corporation kicked in the last $1.5-million.

Mr. Goodstein never set out to be a television star, never set out to make an $11-million series, he says. He was happy at Caltech, where he has been on the faculty for more than 20 years, and is today vice-provost and professor of physics and applied physics.

### Genesis in a 1979 Assignment

The program's genesis was in an assignment Mr. Goodstein accepted in 1979 to rewrite the curriculum for Caltech's two-year physics requirement. The assignment was not lightly given—or received. Mr. Goodstein would be restructuring a spectacularly successful physics curriculum developed by Richard P. Feynman, a Nobel laureate and, according to Mr. Goodstein, "the most important scientist on earth after Einstein died."

But the course needed to be changed. Mr. Feynman "was such a dynamic personality, that taking that course from him was a lifetime experience for those students. He was electrifying," Mr. Goodstein says. "But it was too difficult a course to be taught by anyone but him. With ordinary mortals trying to teach the same course, it didn't work as well."

Mr. Feynman, who died last year, taught physics by relating concepts to contemporary research.

Mr. Goodstein chose an opposite tack. He teaches physics as history, "trying to relate the historical excitement of the original discovery," he says.

When he saw how successful his approach was, Mr. Goodstein sought ways to make it available to others. He settled on television, which he saw as becoming more and more important in education. He felt that "Caltech should be a leader and not a follower in its use," he says.

He also had a personal agenda, one that he did not share with the people at the Annenberg project while he was going back regularly for more money: "I went into it because there is a critical problem of scientific literacy," he says. "Ninety-five per cent of the population is scientifically illiterate. That is a threat to Jeffersonian democracy."

### Enlightenment and Democracy

Democracy, Mr. Goodstein says, requires an enlightened public, and, in a scientific and technological society, that public must be scientifically enlightened. And enlightenment can't wait for college; students need to be reached in high school, Mr. Goodstein says. The most effective way to reach them is by giving high-school physics teachers more training and more course materials.

"I thought this was potentially the best thing I could do," he says. "That's why I gave it five years of my life."

Although the course is used in many colleges and universities either to supplement classroom courses or as a stand-alone telecourse, its greatest success has been in high schools, hundreds of which have purchased the high-school version of the course (which is designed to be used in small bites to supplement a lesson). Hundreds more have copies of the original version carried on public-television stations.

That the television course has been in secondary schools is evident at Caltech. Every student in Mr. Goodstein's freshman-physics course this year saw "The Mechanical Universe" in high school.

Maybe that explains why Mr. Goodstein finds the students "livelier and more interesting than any in years."

And maybe it's because when he shows snippets of animation from the show to drive home lessons just learned, "they love it, and pay more attention when it's on, and applaud at the end."

# Give & Take

**Most Americans will not increase their current levels of charitable activity in 1989, a new study by the Marist Institute for Public Opinion at Marist College has found.**

In a survey of 1,010 Americans conducted in January, almost 70 per cent said they expected to maintain their present level of giving and volunteering. Those who plan to change their level of giving this year tie their decisions to changes in their disposable income. Nearly 54 per cent of those who expect to increase their contributions, for example, say that decision was based on an increase in their income.

Non-profit organizations that rely on volunteers and donors should pay attention to those who already are involved in their organizations, the report says. Those people are the ones who are most likely to increase their support.

■

**Oral Roberts has made another appeal—this time to students at the university he founded.**

The evangelist says he must raise $11-million by May 6 or creditors will start dismantling his ministry and Oral Roberts University. According to press accounts, Mr. Roberts recently told students at a campus chapel service that scandals in other ministries had caused monthly donations to his ministry to decline from $5-million to $2.7-million.

During the service, Oral's son Richard, who serves as the university's executive vice-president, laid a $100 bill at his mother's and father's feet. Then hundreds of students left checks, change, and bills on the stage. About $8,500 was collected, the university said.

Two years ago, Oral Roberts said that God would "call me home" if he didn't raise $8-million for scholarships. Although $9-million was collected, that appeal raised a storm of controversy and exacerbated financial losses at the medical school and hospital (*The Chronicle*, June 8, 1988).

■

**Northern Illinois University, which usually pulls some kind of April Fool's prank with the news media, this year proposed a twist on the leveraged buyout.**

A press release dated April 1 quoted a university vice-president as saying he would lead a buyout of the university so that "its true market value will finally be achieved."

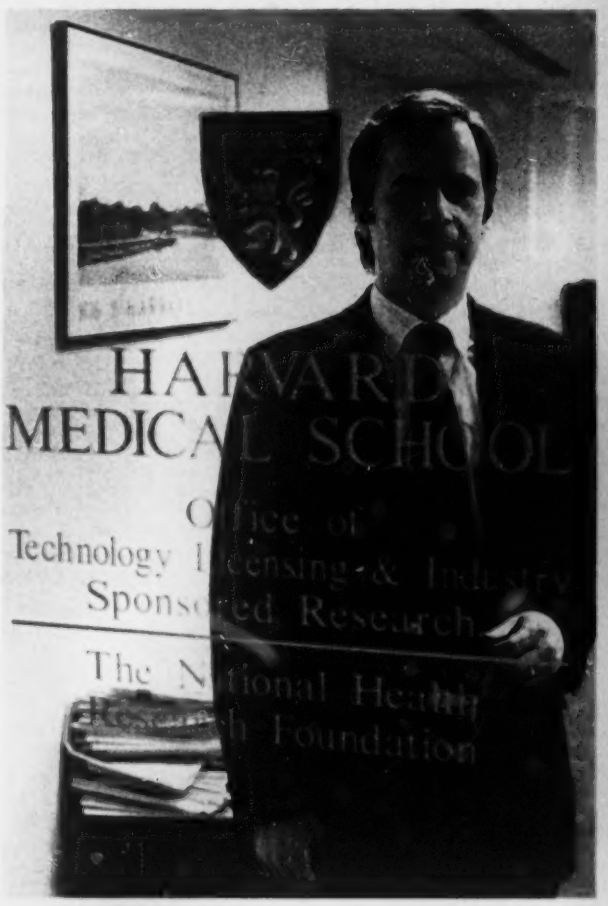
"Our shareholders, the people of Illinois, deserve better than they've been getting from our state legislature, which is starving Northern and public schools at all levels," said Tom Montiegel, vice-president for development and university relations.

Bob Woggon, director of public information, said the university was tired of saying that Illinois public institutions deserve more tax support. "This year we thought we would have a little fun with it."

## Business & Philanthropy

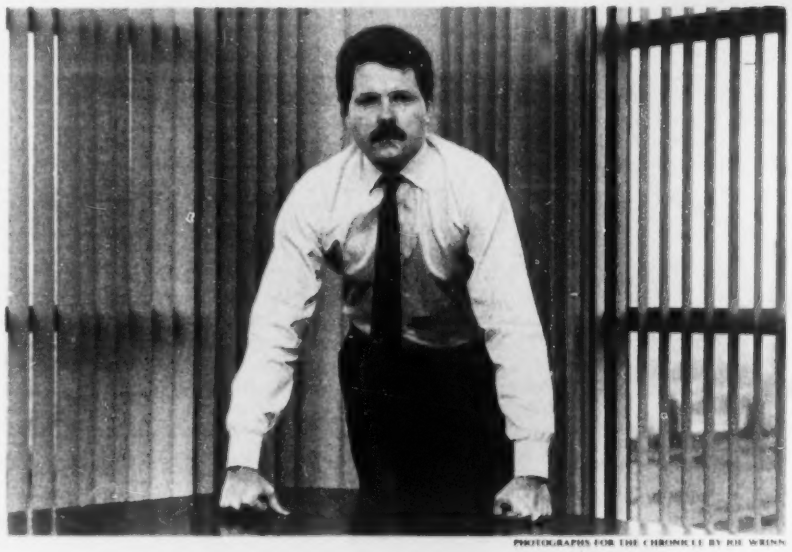
# *Universities Said to Go Too Fast in Quest of Profit from Research*

## Campus officials warn of underestimating risks




Stephen P. Atkinson of Harvard Medical School: "If you enter into business with your faculty it represents an unacceptable conflict."

E. Michael Egan: "They all want million-dollar, up-front payments and all sorts of research funds. Everybody wants to be the Donald Trump of licensing overnight."



PHOTOGRAPHS FOR THE CHRONICLE BY JOE WRINN

By GILBERT FUCHSBERG

An explosion of new efforts among universities to profit from their research has raised concerns that the "technology transfer" field may be growing too fast.

Although more institutions are taking a close look at their practices and policies, campus patent officials fear that many have not developed adequate measures to guard against potential ethical, legal, and financial problems involved in bringing technology to the marketplace.

The primary worry is that many institutions see only dollar signs, and are ignoring warning signs, as they accelerate into an area pocked with pitfalls.

Many believe universities are paying insufficient attention to the potential for conflicts of interest, a long-time concern that grows more threatening as ties among universities, businesses, and professors become more common and complex.

Some also fear that universities are overestimating the potential payoffs and underestimating the many legal and financial risks associated with converting laboratory discoveries into commercial products.

### Lawsuits at Illinois

The University of Illinois is learning about those issues the hard way. University officials have been hit by a pair of lawsuits involving a company founded by a faculty member to market computer technology he developed.

"If one is not careful, the dangers involved can compromise the values and mission of the university," says C. K. Gunsalus, assistant vice-chancellor for research at the University of Illinois. The attitude of many universities, she says, "seems so cavalier."

"I say 'Wait.' It's so much more complex and so much more dangerous," she continues.

So far, universities have been left to police themselves, and many are adopting more stringent guidelines to cover such issues as stock ownership and spin-off companies developed around university technology. But those efforts may not be enough. Pressure is growing in some circles for federal scrutiny of researchers and their financial links.

### Scene Changed in 1980

Some universities started seeking profits from their sponsored research decades ago. But the scene changed dramatically in 1980, when a new law granted universities the right to retain most patents that arose through federally financed research, which constitutes the bulk of research conducted on the nation's campuses.

The law allowed universities, with some restrictions, to commercialize patented discoveries developed with federal funds. Typically, they do that through licensing agreements under which companies pay them an up-front fee as well as royalties based on a share of product sales.

Only in the last three years or so, however, following some adjustments to the law and some early successes, have more than a few dozen institutions sought to exploit those commercialization rights in an aggressive way.

No one has a firm sense of how much the field has grown or how lucrative it may prove to be. But by some accounts, between 150 and 200 institutions are now engaged in some form of technology transfer. Membership in the principal national organization of university patent officials has nearly tripled in the last five years, and now includes some 400 people from more than 125 universities.

To be sure, the field continues to be dominated by Stanford University, the Massachusetts Institute of Technology, the Wisconsin Alumni Research Foundation, and a handful more. And the most

active research institutions continue to increase their efforts. In the last seven months alone, for example, Harvard and the Johns Hopkins Universities and the University of Chicago have started multimillion-dollar venture-capital funds to invest in start-up companies based on profitable work emerging from their labs.

More institutions are getting in on the act. Many operations remain modest, and dozens of universities delegate their licensing activities to outside companies. But in growing numbers, universities are expanding their campus patent offices, compiling catalogues and data bases of their discoveries, seeking high-stakes licensing deals, and spawning new companies in partnership with their professors.

### U. of Houston Gets $4.5-Million

The University of Colorado, for example, recently set up a for-profit company to help develop promising technologies, and two spin-offs have occurred so far. The Ohio State University last year hired a scientist with business experience to solicit corporate interest in new discoveries. Cornell University just added "technology marketing" to the title of its patents office, to recognize its expanding role.

In one of the biggest deals yet, the University of Houston last summer sold for $4.5-million the exclusive rights to superconductivity advances developed there. That amount may soon be dwarfed. At the University of Utah, expectations are high that a recently announced breakthrough in fusion will overcome its many doubters, prove a viable source of cheap energy, and yield tens of millions of dollars to its inventors and the university.

"We have people telegramming from around the world saying, 'We're flying in

*Continued on Following Page*

**Top 20 Universities Receiving Patents**

| | 1986 | 1987 | 1988 |
|---|---|---|---|
| Mass. Inst. of Tech. | 42 | 66 | 66 |
| U. of California | 54 | 65 | 60 |
| Stanford U. | 33 | 42 | 56 |
| U. of Minnesota | 15 | 28 | 27 |
| U. of Florida | 10 | 13 | 24 |
| Johns Hopkins U. | 19 | 18 | 22 |
| U. of Wisconsin * | 17 | 11 | 21 |
| U. of Texas | 24 | 10 | 20 |
| Harvard U. | 2 | 5 | 20 |
| Cal. Inst. of Tech. | 25 | 27 | 18 |
| Cornell U. * | 15 | 29 | 16 |
| Columbia U. | 6 | 7 | 16 |
| Iowa State U. | 9 | 15 | 15 |
| U. of Michigan | 10 | 1 | 15 |
| Ohio State U. | 5 | 6 | 14 |
| Rockefeller U. | 4 | 10 | 11 |
| U. of Rochester | 8 | 6 | 11 |
| State U. of N.Y. * | 11 | 18 | 10 |
| U. of Utah | 8 | 12 | 10 |
| Northwestern U. | 8 | 11 | 10 |

* Indicates a research foundation.

SOURCE: UNIVERSITY OF MINNESOTA

# *Pressure to Cash In on Research Stirs Conflict-of-Interest Issues*

By DAVID L. WHEELER

Increasing pressure on scientists from federal and state governments and their own universities to move research out of the laboratory and into profitable use has resulted in a backlash of concern over financial conflicts of interest.

Congress, federal research agencies, and the scientists themselves are increasingly scrutinizing the conflicts involved in research, an area that has been vaguely and irregularly defined in the past.

The federal investigations now under way focus on the financial ties between researchers conducting drug trials and the companies that make the drugs. In the past year, at least two Congressional committees and the Inspector General of the Department of Health and Human Services have looked into potential conflicts of interest in drug research. The National Institutes of Health have indicated that they will begin restricting drug researchers' financial ties to pharmaceutical companies (*The Chronicle*, March 22).

One group of biomedical researchers who are beginning a study of treatments for patients after they undergo coronary-bypass surgery is not waiting for others to impose conflict-of-interest standards. In last week's *New England Journal of Medicine*, the scientists, from Baylor College of Medicine, the University of Minnesota, and some other research institutions, took the unusual step of setting their own conflict-of-interest policies.

### Research Could Affect Millions

The scientists said they felt that imposing guidelines on themselves was necessary because of the tremendous interest on the part of the general public and those in the financial markets in the outcome of clinical trials and because of the lack of any widely accepted definition of conflicts of interest. The scientists said their research could ultimately affect millions with coronary-artery disease.

The group of researchers pledged that, while the study was in progress, they would not hold stock in the companies making or distributing the drugs being evaluated.

The scientists also vowed that neither they, their dependents, nor their spouses would serve during the study as paid consultants to companies with drugs under study.

Scientific societies and university associations, already trying to ward off federal interference in science after Congressional hearings on scientific fraud, have quickly begun to examine the conflict-of-interest issue.

The Association of American Universities and the Association of American Medical Colleges are surveying their members about conflict-of-interest guidelines. The

> **"We view conflicts of interest as being potentially more serious than classical scientific misconduct."**

Association of American Universities found, in an early sample of its members, that many of them were making revisions.

The American Association for the Advancement of Science is also considering a project on conflicts of interest in scientific research, and, at the request of the Department of Veterans Affairs, the National Academy of Science's Institute of Medicine is defining some conflict-of-interest issues in biomedical research and education.

In the current debate, some of the questions arising are:

- Should there be limits on how much money a university scientist should receive from a private company with products related to his research?
- Should university scientists let companies pay for their trips to scientific meetings and pay them to talk at those meetings about topics related to the company's products?
- Should scientists disclose their corporate affiliations when they are giving advice to the public?
- Should scientists who review other scientists' work for federal research agencies or for scientific journals have a financial stake in whether or not the research they are reviewing receives a grant or is published?

### 'They Need a Financial Reward'

The possibility that conflict-of-interest policies might be tightened is not viewed favorably in all quarters. The National Institutes of Health have received some opposition to their proposal to restrict drug researchers' financial ties. Some university administrators say it is unfair to reverse a federally supported trend toward more industrial support of research.

"Congress has passed a series of laws to encourage universities to interact with industry," says Nathan B. Dinces, the director of industrially sponsored research at Dartmouth College. "Now we have N.I.H. saying they want very limited financial involvement."

Mr. Dinces says he believes drug trials need especially close scrutiny but says he is concerned that the idea of limiting scientists' financial involvement will spread to other areas of research. "Faculty aren't always going to conduct research out of the goodness of their hearts," he says. "They need a financial reward like everyone else."

Diana M. Zuckerman, a staff member for a Congressional subcommittee that has held hearings on conflicts of interest in scientific research, says that "I've been getting tremendous flak from university administrators who say that if they have to take away the ability of faculty to earn extra money, they'll lose all of their faculty. I'm not convinced."

The subcommittee, part of the Committee on Government Operations, is planning another hearing later this spring. Ms. Zuckerman says she expects that one issue that will be raised is, Who owns the data in studies that the federal government sup-

*Continued on Following Page*

# *Boston U. Gambles On Its Big Investment in Biotechnology Company*

BOSTON

Many universities dream of striking it rich with a single investment. Boston University may have tied its fate to one.

Since 1980, the university has committed nearly $50-million to become the majority owner of Seragen Inc., a biotechnology company that is developing treatments to fight leukemia and other diseases.

The university believes that its investment will one day yield substantial returns, perhaps hundreds of millions of dollars. That could do wonders for the university's endowment, which at $166-million is smaller than endowments at most of its peer institutions.

But with biotechnology, many investors have learned, there are no guarantees. The soonest Seragen expects to see profits is 1993, after marketing its first products. Until then, B.U. is prepared to spend $1-million a month just to keep the company afloat while it refines its products.

Those monthly infusions of operating funds—representing more than 2 per cent of the university's $540-million budget this year alone—could raise the university's commitment to more than $100-million before it gets a penny back.

Already the investment represents perhaps the most substantial—and most risky—single commitment ever made by a university to one fledgling company. But B.U. officials believe Seragen is a good bet.

### 'A Very Promising Situation'

"We see this as a very promising situation for us," says Jon Westling, B.U.'s executive vice-president. "The company is increasing in value on a daily basis."

The university was among the first to invest in Seragen when it was formed in 1980 by researchers affiliated with B.U.'s School of Medicine.

Through 1985, according to university documents, outlays to Seragen from a university venture-capital fund totaled $1.2-million.

A Norwegian drug concern took control of Seragen in 1985, but after investing $20-million it decided in 1987 to get out. So the university bought in, purchasing a majority of Seragen for $25-million and guaranteeing a $10-million loan.

The university had hoped to turn a big profit by taking the company public. But the October 1987 stock-market crash put plans for a public offering on hold.

Meanwhile, Seragen has needed cash. So, since June of last year, the university has loaned the company $12.9-million. B.U.'s total commitment thus far: $49.2-million. Its share of Seragen: 73.4 per cent.

As clinical tests of the company's first cancer treatment got under way last week, university officials were said to be angered by reports skeptical of Seragen. *Business Week* quoted one source as saying: "B.U. has got to get out of an embarrassment."

The university thinks Seragen will be worth $1-billion by 1999. A partner could help finance the company's marketing efforts, Mr. Westling says, but the university wants to retain a majority interest even if other investors come aboard. That way, the university can turn out the biggest winner—if, that is, its dream doesn't go bust.

—GILBERT FUCHSBERG

# *Universities Said to Go Too Fast in Search of Profits*

*Continued from Preceding Page*

with our checkbooks. Please be available'," says Norman Brown, director of Utah's technology-transfer office. The university is holding off, pending confirmation of the discovery, but some 200 companies have contacted the university already, and preliminary licensing plans are under discussion. "The potential is enormous," Mr. Brown says.

Although the prospect of major breakthroughs and big-dollar deals has helped fuel increased interest in technology transfer, there is also growing political momentum for universities to contribute—through new companies and products—to their local economies as well as the country's competitiveness. Many states have picked their public research institutions as bases for new research parks, "incubators" for fledgling businesses, and venture-capital pools for investing in high-tech start-up companies.

Other factors are in play, too. "I don't think anybody is doing this purely for patriotic reasons," says Alistair M. Brett, director of technology transfer at Virginia Polytechnic Institute and the organizer of a conference next month on university spin-offs.

To keep their faculty members happy, many universities consider it crucial to allow them opportunities for outside activity and additional income. Encouraging spin-off companies—and sharing royalties with inventors—is one way to accomplish that. Technology transfer has also become a prime vehicle for new research dollars, as more companies agree to sponsor campus research in exchange for rights to develop whatever discoveries may emerge.

### Odds Against Success

So far, corporate sponsorship of university research—which totaled about $750-million last year, about one-tenth of the federal research contribution—has far outweighed income from licensing. By some estimates, licensing income to all universities totaled about $50-million last year, less than many institutions receive from private donations each year.

One reason licensing income may never become very significant for most institutions is that most discoveries aren't profitable. Of those that are patented—and only a small share of discoveries merit patents—it is generally believed that one in 10 will make enough money to recover its filing costs. One in 100 may make between $20,000 and $50,000. Only one in 1,000 will prove a major money-maker.

Still, the odds against big successes haven't stopped universities from seeking them. Some believe, however, that expectations are too high.

"Many universities think that every invention from a faculty member is worth millions of dollars and is the appropriate basis for a spin-off company," says John P. Holloway, patent officer at the University of Colorado Foundation. "But that's just not true."

> "Would you give preference to a professor on tenure because you have stock in his company?"

E. Michael Egan, director of business development at Repligen Inc., a medium-sized biotechnology company in Cambridge, Mass., is often solicited by universities offering to license potential discoveries, but increasingly he is put off by their demands. "They all want million-dollar, up-front payments, royalties through the roof, and all sorts of research funds," he says. "Everybody wants to be the Donald Trump of licensing overnight."

What many universities new to technology transfer do not understand, Mr. Egan says, is that many companies cannot afford to pay hefty up-front licensing fees.

While some biotechnology inventions prove profitable—such as the gene-splicing technique that earns Stanford millions of dollars each year—most do not, and it often takes years of additional research costing millions of dollars just to find out.

John F. Thuente, director of patents and licensing at the University of Minnesota, says he has heard many complaints about hefty licensing requests. He sees that as a symptom of there being "500 people who didn't have a job in this field five years ago."

"Clearly a lot of people on the university side are inexperienced in this business," he says. About 10 per cent of the University of Minnesota's licensing proposals have been rejected, but it happens less frequently now that the university tries to accommodate interested companies, Mr. Thuente says. "If you're interested in getting the products of your research out, you have to have a reasonable approach to licensing."

Legal and financial risks are another growing worry for institutions increasing their technology-transfer activity.

Until now, universities have considered the legal dangers involved in commercializing technology as remote. Many institutions have assumed that their liability is limited because they often license ideas in rough or early form, distant from the refined technologies or products that companies eventually develop.

But concerns are growing that universities may be drawn into legal actions involving products based on their ideas. One reason is that more universities are seeking to commercialize products that may lead to vaccines, diagnostic tools, and other technologies with medical uses and consequences for human life.

"Generally the courts have been kind to universities, maybe because they thought universities weren't sophisticated," says Genevieve G. Stubbs, assistant general counsel for the Texas A&M University System and co-chair of a nationwide group of university lawyers examining technology transfer issues. "I think that might change."

### Lawsuits Involving Patents

While no universities have been named in suits yet, many now require companies they license to carry liability insurance and to assume all risks for their products.

Still, technology transfer has forced some universities into court, to fight lawsuits involving their patents. In the last year alone, Cornell University settled in its favor two cases in which it alleged that companies had infringed on its patents.

One suit was worth plenty to Cornell. It concerned a patent on a vaccine that had earned the university $300,000 in licensing fees. The settlement forced a company to take out a license on the vaccine. "You litigate to make money, not to make a point," says H. Walter Haeussler, director of patents and technology marketing at Cornell.

To many, worries about the bottom line are less important than concerns about potential ethical problems associated with commercial arrangements on their campuses.

The most basic fears are that the potential for profit will skew research, compromise teaching, and influence hiring decisions. Most institutions have developed guidelines to guard against such possibilities, but many are reviewing their policies to insure that they are adequate.

One is the University of Illinois, where officials spent two years negotiating agreements to license computer technology developed in a university laboratory to a company run by the lab's director.

After the 1985 deal was signed, questions arose about accounting procedures and other issues related to laboratory staff members' working at and holding a stake in the company. A university investigation followed, as did two lawsuits from two former lab workers who charged, among other things, that university funds had been misused to help promote and develop the private company.

Those named in the suit have denied any illegal activity, as has the university. But after a review of the original agreements with the company, "we did conclude that our policies and practices were not sufficient to preclude conflicts of interest or the appearances of conflicts of interest," says Judith Rowan, associate chancellor for news and public affairs.

"We left holes a truck could go through," says Ms. Gunsalus, the assistant vice-chancellor for research who helped negotiate the agreements. "If we were more experienced, we could have done a better job."

> "Many universities think that every invention from a faculty member is worth millions."

While the university's conflict-of-interest policies were once general and ambiguous, Ms. Gunsalus says, now they are more explicit and direct. The university also requires all academic staff members to report all non-university income-producing business activities and potential conflicts.

"You can't do anything about conflicts until they're disclosed," Ms. Gunsalus says.

Stephen H. Atkinson, director of technology licensing at Harvard Medical School, says most conflict policies "need to be more clearly written. Most are short on specifics, and very impressionistic."

Rather than adopt across-the-board guidelines to anticipate most contingencies, some institutions handle the potential for conflicts on a case-by-case basis.

The University of Utah has had several sticky situations, Mr. Brown says, but that hasn't slowed licensing and spin-off activity, which has increased significantly in the past three years.

"We're keeping our fingers crossed," he says. "We understand that nothing's perfect."

### Stock in Start-Up Companies

Concerns about potential conflicts have also prompted increased worry about the practice of universities' accepting stock in start-up companies in lieu of or in addition to cash royalties.

Stanford, which led all universities with $9.2-million in licensing income last year, refuses to accept stock in any company in which one of its professors has a stake. "The primary concern is conflict," says Katharine Ku, the university's associate director of licensing. "Would you give preference to a professor in a tenure decision because you have stock in his company?"

Harvard shuns all equity holdings. "If you enter into business with your faculty it represents an unacceptable conflict," says Mr. Atkinson.

Some have questioned whether Harvard will be able to avoid conflicts once a $35-million fund it is organizing to invest in profitable discoveries gets under way, but Mr. Atkinson insists the fund was designed to insure against ethical problems. It will be independent of university control, will involve no university money, and will be subject to review if questions arise.

M.I.T. has no plans to organize a venture-capital pool for investments in its professors' companies, but has no aversion to accepting stock in lieu of cash as part of its licensing deals. To avoid conflicts, however, M.I.T. will not accept research funds from any company in which either the institute or one its faculty members holds stock.

Says John T. Preston, M.I.T.'s director of technology licensing: "We don't want to see research biased by commercial reward."

# Scientists Grapple With Conflicts of Interest

*Continued from Preceding Page*

ports—the universities, the researchers, or the federal government?

The House Energy and Commerce Committee, which wields authority over the National Institutes of Health, has also been investigating some instances of conflict of interest in scientific research.

A member of the committee staff says: "We view conflicts of interest as being potentially more serious than classical scientific misconduct."

Fraud legislation being drafted by the committee may require the Secretary of Health and Human Services to draw up conflict-of-interest guidelines for federally supported research, the staff member says.

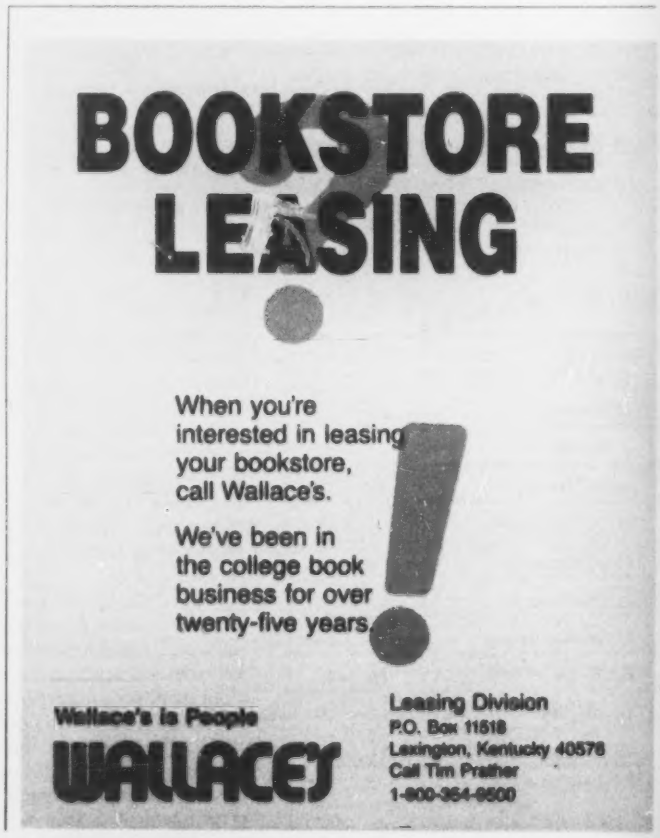
### Many Dual Affiliations Found

Documenting the extent of scientific conflicts of interests may be somewhat easier than documenting the extent of scientific fraud. Sheldon Krimsky, an associate professor of urban and environmental policy at Tufts University, says he has spent four years documenting the corporate affiliations of biomedical researchers.

While he is reluctant to talk about his final results because he has not published them, he says: "In prominent institutions—the ones seen as having the best biomedical researchers—the number of active scientists with dual affiliations is quite large."

One remedy to the thorny issues posed by financial conflicts of interest has been suggested by Arnold S. Relman, editor of the *New England Journal of Medicine*, which is one of the few scientific journals to require researchers to disclose their financial stake in research. Dr. Relman has suggested that medical researchers get a one-time payment from drug companies for successful research, but that continuing payments be prohibited.

"If down the road a product goes sour," says Dr. Relman, "or doesn't turn out to be as good as a new product, that expert has to be counted on to tell the truth to the public. If he's sending his kids to private school on the royalties, he might not be objective."

**UPDATE ON MINORITY GROUPS**

# 'Life Gets Better' Program; 'Multicultural Awareness' at Temple U.; More

**Florida A&M University promises top black high-school students that "life gets better"** if they study hard and excel in science, mathematics, and engineering courses.

It keeps its promise by handing them airplane tickets the day after they graduate from high school. The tickets take the students to some of America's major corporations, which provide them with internships and four-year scholarships.

Forty-seven students are now participating in the university's program, "Life Gets Better."

Says Florida A&M's president, Frederick S. Humphries: "I wanted to create a scholarship program that would make it instantly rewarding for those students who had paid attention and achieved in science and engineering courses."

Under the program, companies that agree to sponsor students pay all of their college costs.

Students also spend four consecutive summers at the companies on paid internships.

A wide range of businesses are participating, including Honeywell Inc., the General Motors Corporation, and the Monsanto Corporation, university officials said.

While the program started out emphasizing science and engineering, students are now receiving scholarships to pursue other subjects as well, including accounting, computer science, economics, and pharmacology.

■

**Fifteen institutions attracted nearly half of the 742 freshmen who won grants in 1988** from the National Achievement Scholarship Program for Outstanding Negro Students.

A report from the National Merit Scholarship Corporation, which sponsors the annual competition, shows that a total of 150 colleges enrolled the freshman scholars—309 students at 73 public institutions and 433 at 77 private institutions.

A ranking of colleges and universities that enrolled the greatest number of freshman achievement scholars was compiled by *The Chronicle* using a list from the scholarship corporation.

The following 15 institutions enrolled the greatest numbers in 1988:

Harvard U., 69
Stanford U., 42
U. of Texas at Austin, 30
Yale U., 22
Florida A&M U., 21
Massachusetts Institute of Technology, 20
Princeton U., 20
Duke U., 18
Northwestern U., 18
Georgia Institute of Technology, 17
Howard U., 17
U. of Illinois at Urbana-Champaign, 17
U. of Florida, 16
Brown U., 15
U. of Alabama, 15

■

**The federal Bureau of Land Management hopes to hire more blacks, Hispanics, and other members of minority groups** with the help of Wayne County Community College and the University of Michigan.

The bureau—part of the U.S. Department of the Interior—began working with the two institutions during the winter on a program to increase the number of minority students who earn degrees in natural resources and to train them for positions as ecologists, geologists, park managers, and range conservationists, among others.

The first class of the new program was convened this winter with about 35 students, said Cassell A. Lawson, executive dean at the community college's downtown campus.

At Wayne, students pursue an associate-degree program that features special courses on natural resources taught by bureau professionals.

Eight bureau experts are taking turns teaching a course this semester called "Public Policy and Federal Land Use."

Students who successfully complete the associate-degree program with at least a B average are guaranteed admission to the University of Michigan's bachelor's program in natural resources, said Harrison L. Morton, a professor in the university's school of natural resources.

Participating students will be brought to Ann Arbor to become familiar with the campus and will be counseled on the careers and summer jobs available in natural resources, he said.

"We can't promise them jobs, but the intent is to tap them when they graduate from Michigan," said Ernie D. Jones, a bureau program manager who works with historically black colleges and universities.

"The bureau does not have a representation of minorities among its professionals," he said. "This is one way the bureau is going to start growing its own."

■

**Student-government leaders at Temple University organized a week of activities to raise "multicultural awareness"** on the campus and reduce racial tensions.

Billed as an "anti-racism" campaign, the event was held last month and featured rallies, panel discussions, films, and a cultural fair.

Racial tensions on the campus were heightened earlier this year by the formation of a "white pride" group calling itself the "White Student Union."

The group seeks to promote white culture and abolish affirmative action. The group's existence, along with recent publicity about racist incidents on the nation's college campuses, prompted Temple student leaders to act.

"We decided it's time for student leaders to stop being apathetic about these racial tensions," said Glenn M. Sapadin, press secretary of Temple's student government. "It's time to be pro-active, and not reactive."

Most of Temple's student organizations participated in the event. "We wanted to get them all to share with the Temple community certain aspects of their cultures," Mr. Sapadin said. "It's meant to bring us all together." —DENISE K. MAGNER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